SKYWARN

Storm Spotter's Newsletter

Spring 2011

National Weather Service, Mt. Holly, NJ

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Newsletter for Spotters

Hello and welcome to yet another issue of the Mount Holly Skywarn Newsletter. Once again, we had a busy winter. It started the day after Christmas, with the first of two major snow storms. January was cold and snowy and culminated with another large snow storm at the end of the month. Fortunately, it wasn't nearly as snowy as the winter of 2009-2010. Then after a relatively quiet February, we ended up with some big flooding in March.

We have implemented some changes to the Skywarm program, including County e-mail lists so we can contacted all of our spotters in an individual county to request reports or for other information. Therefore, its more important than ever to keep your e-mail up-to-date. Also, we are in the process of rolling out a graphical version of our Skywarn database which will be more interactive than our old text only version and will allow us an easier way to contact spotters based where storms are occurring.

Tsunami!

By Joe Miketta-Warning Coordination Meteorologist

The devastation that occurred in Japan on March 11, 2011 as a result of a 9.0 magnitude earthquake underscores the need to be prepared for every type of natural disaster that Mother Nature can throw at us. While major earthquakes on the east coast are rare, they have occurred in the past and will occur again in the future. Unfortunately, a common misconception is that if major earthquakes are rare, then east coast tsunamis are even less likely to occur. Not so!

Tsunami, a Japanese word meaning "harbor wave", can be caused by an earthquake which vertically displaces water above it. So certainly an earthquake that occurs under the ocean can be one source for a tsunami. However, an even greater threat for tsunami along the U.S. east coast is a slump along the continental slope several hundred miles off shore. A slump is basically an underwater landslide in the area where the continental slope drops off into the deeper waters of the Atlantic Ocean. If such a slump is large enough, it could cause a tsunami with a 3 foot wave run-up in the vicinity of Atlantic City.

NOAA's West Coast / Alaska Tsunami Warning Center (WC/ATWC) in Palmer, Alaska has responsibility for monitoring seismic activity in the Pacific and Atlantic

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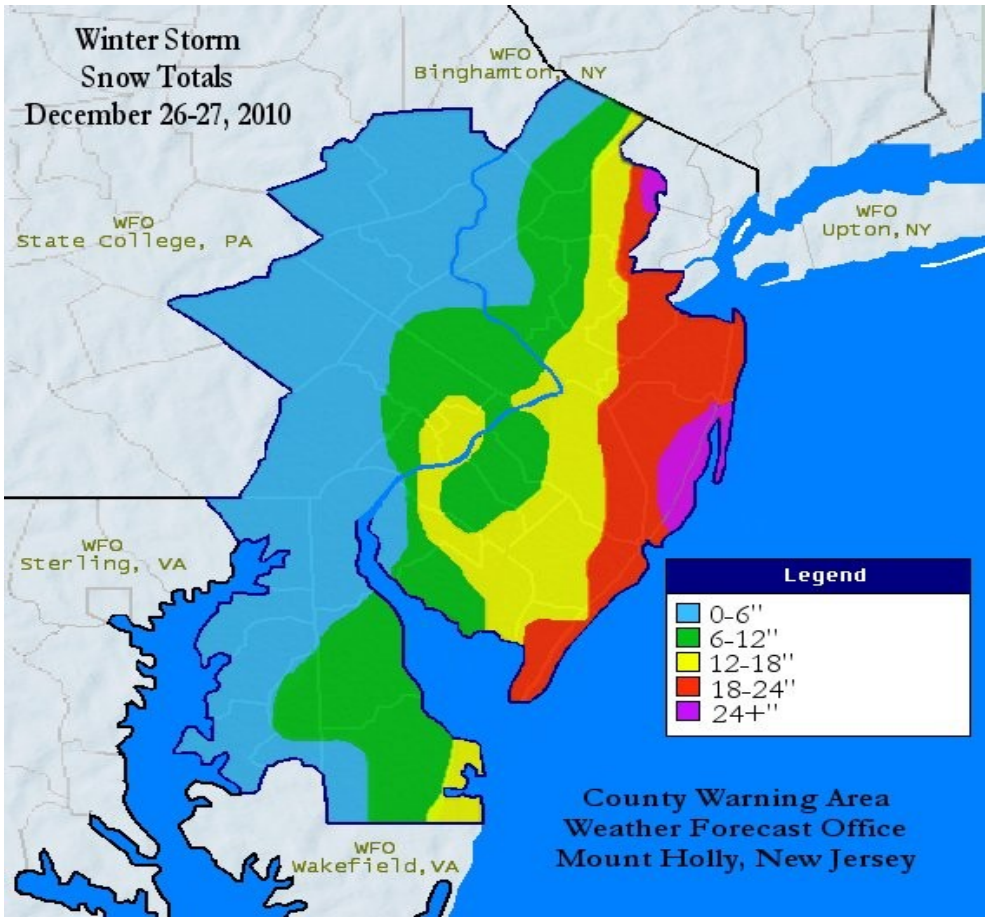
Winter Storms

Larry Nierenberg



A strong Nor'easter system impacted the Middle Atlantic region starting early Sunday morning December 26th and ending on Monday December 27th. At 7AM on the 26th, the center of the low pressure was sitting just offshore of Cape Hatteras and the northern most extent of its snow bands had started to fall across the Delmarva Peninsula and the southern most counties in New Jersey. By noon on Sunday the 26th, snow had begun to fall in the Philadelphia Metro region and continued to overspread towards the north during the remainder of the day. Heavy snow bands formed off-shore during the afternoon and evening hours on the 26th as the low continued to strengthen. The heavy bands pushed into the coastal counties in New Jersey with continued 2 to 3 inch an hour snowfall rates during the evening and overnight hours on the 26th. As the low pressure system moved along the Eastern United States coast it rapidly intensified dropping 24 millibars in 24 hours to a minimum pressure of 976 millibars by 7AM Monday the 27th. At this time the low was centered over Cape Cod Massachusetts and the snow was beginning to end from South to North through our region. By mid-day on the 27th the snow had come to end across our region.

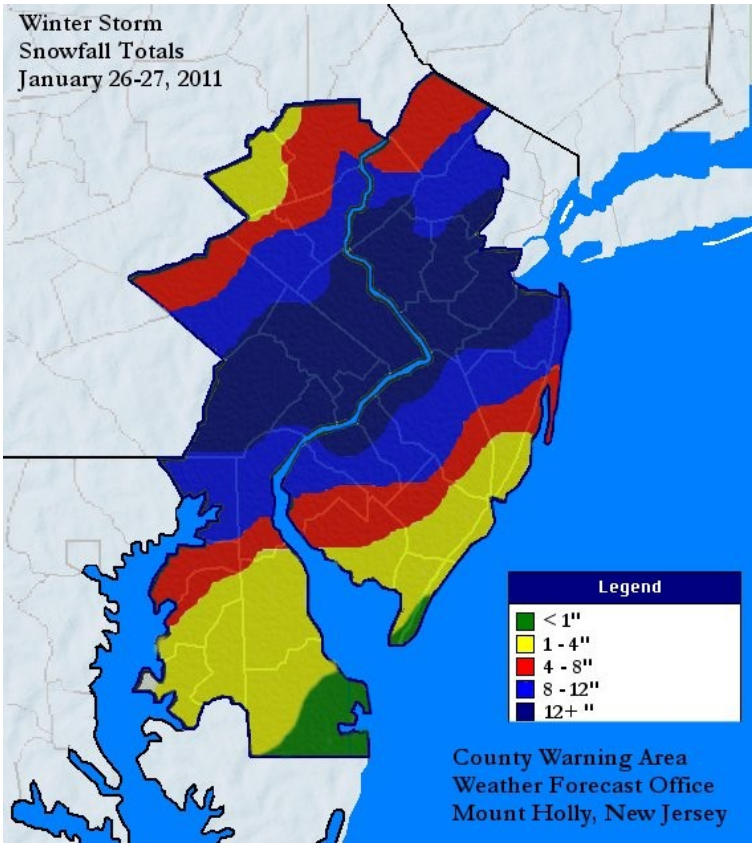
Winter Storms Continued

-Larry Nierenberg

Significant accumulations were received across the Philadelphia Metro region and Eastern New Jersey. Atlantic City New Jersey (measured at the airport in Pomona) set an *ALL* time record for a single snowfall total of 20.1 inches. Numerous locations along the New Jersey coast received 20 inch or higher amounts, with the greatest snowfall measurement of 30 inches taken in Brick Township in New Jersey. Due to the offshore track of the nor'easter, the western counties in our forecast area did not receive as much snow as the eastern counties. Berks, Lehigh, Northampton, Carbon, and Monroe counties in Pennsylvania; Cecil, Talbot, Kent, and Queen Annes counties in Maryland, received only 1 to 3 inches during the storm. Traveling further east, towards the coast, Cape May, Atlantic, Ocean, Monmouth, and Middlesex counties in New Jersey totaled 18 to 24 inches of snow, with more localized pockets of 24 inches or more along the immediate coast. Winter storm watches were issued early on Christmas morning for most of the area and the rest of the region was included later that morning. All counties were placed under a winter storm warning on Christmas afternoon. Some areas were later upgraded to a blizzard warning. This event was interesting in that earlier in the week it looked like the track would be out to sea and it would be a non-event.

Gusty northwest winds were also a factor with this coastal storm. Some of the highest wind gusts recorded include 62 mph measured at Wilmington, DE; 61 mph measured in Long Beach, New Jersey; 56 mph measured in Sandy Hook, New Jersey; and 62 mph measured in Mount Pocono, Pennsylvania. Wind gusts in excess of 50 mph were measured across much of the forecast area. Strong winds along with the falling snow created reduced visibilities and blizzard or near-blizzard conditions at times, especially along the New Jersey coastline. Multiple heavy snow bands traversed the region producing 2 to 3 inch an hour snowfall rates during the evening hours across Eastern New Jersey. A few of these bands were able to make it into the Philadelphia metro region later Sunday night producing 1 to 2 inch an hour snowfall rates. At the peak of the storm, strong winds greatly reduced visibilities and created impassable roadways throughout the region. Numerous traffic backups and accidents occurred across New Jersey and Pennsylvania roadways on Sunday and Monday. Portions of the Garden State Parkway were shutdown with hundreds of cars left stranded. Snow drifts reached 8 to 9 feet in some locations and turned a once clear, plowed road, into an impassable piece of asphalt. At approximately 8pm on Sunday December 26th, during the peak of the storm, a state of emergency was declared for New Jersey by the acting Governor. The Philadelphia Eagles were scheduled to play football at 8pm Sunday night in Philadelphia, but the National Football League, fearing for fans safety during the worst of the storm, decided to postpone the game until the following Tuesday night.

More Winter Storms



An area of low pressure started to take shape off the Texas coast in the Gulf of Mexico on Monday January 24th. This area of low pressure slowly began to strengthen and eventually moved inland as it trekked up through the Southeastern United States on Tuesday January 25th. As the low deepened, energy was being transferred to a weak surface wave off the coast of North Carolina early Wednesday January 26th. This coastal wave started to produce precipitation over the Southern Delmarva shortly after 2AM on Wednesday the 26th and quickly spread to the north during the early morning hours. By noon, areas south of Philadelphia were experiencing a brief respite in the precipitation action, but another dose of winter weather was quickly approaching from the southwest.

The second wave of action came in fast and heavy starting around 4pm across the Delmarva, brought on by the parent low pressure system sitting over Southern Virginia. As the low moved towards the coast more energy was transferred to the slow moving coastal low and heavier precipitation started to spread further north and east. The coastal low finally started to wind down early on Thursday January 27th from west to east, eventually pulling far enough to the northeast to no longer have an affect on the region by mid-morning.

Heavier bands of rain were experienced across the southern Delmarva while further north and west a light snow began to fall. By 5AM, with the coastal low just offshore of the outer banks of North Carolina, the heaviest precipitation, due to warm-air advection, was falling over central Delaware and southeastern New Jersey. At this time a moderate intensity rain was falling over central and southern Delaware with all other areas north and west seeing a light snowfall. With a stronger northeast wind blowing in off the Atlantic Ocean coastal areas in southeastern New Jersey along with most of the Delmarva had a change over from snow to moderate to light rain for a few hours during the late morning and early afternoon hours. This helped to keep the snowfall accumulation suppressed in these areas. All in all the first batch of moisture to be rung out over the region produced up to 6 inches across locales in southeastern Pennsylvania, with the highest amounts in Chester and Montgomery counties. Areas north of Philadelphia in New Jersey received an average of 2 to 4 inches with the highest amounts in Mercer, Hunterdon, and Somerset counties.

By 4PM on the 26th heavy precipitation was just to the west of the region. Frequent lightning was noted in southern Maryland and northern Virginia, due to atmospheric instability aloft. These strong areas of convection continued to move towards our region and by 5PM heavy rain and thunderstorms were seen over central Delaware. An inundation of sleet started to fall across southeastern New Jersey by 6PM and most areas recorded nearly an inch of sleet before changing over to snow. Numerous locations recorded thunder-sleet between 5PM and 7PM across central New Jersey, and even pea size hail was reported along coastal sections of Ocean and Monmouth counties! Meanwhile over in Pennsylvania the heavy sleet turned to all snow by 7PM in areas west of Philadelphia, while a mixing of snow and sleet still fell in the metro area. The entire region turned over to all snow by 9PM on the 26th. Thunder-snow was reported in Chester, Montgomery, and Bucks counties during the height of the storm. Snow-fall rates exceeded 4 inches an hour in some spots where very narrow mesoscale bands had set up and become nearly stationary for a couple of hours. These narrow bands produced copious amounts of snow that fell very fast and very hard across portions of the Philadelphia metro area and northern New Jersey.

Over a foot of snow fell across portions of the region with the second batch of snow alone...quite a feat in only 9 hour time period. Occasional wind gusts of 25 mph were experienced across the region which, coupled with heavy snowfall, caused near whiteout conditions in some areas. The hardest hit areas of 16 inches or more were strewn across the region from Chester county in Pennsylvania northeast through Delaware, Philadelphia, Bucks, and Montgomery counties and then extended into Mercer, Hunterdon, Warren, Somerset, Middlesex, and Monmouth counties in New Jersey. There was one location in Gloucester county that reported over a foot and half, 19 inches, after the storm pulled out. Due to the mesoscale banding and mixed precipitation occurring over southeastern New Jersey and the Delmarva, snowfall accumulations in those areas were much less. This double whammy storm system caused numerous traffic delays during the morning work commutes on January 26th and 27th. Due to the ferocity of the snowfall generating near whiteout conditions, multiple interstates across the region had restricted speed limits and snow removal crews had a very tough time keeping the roads clear enough to safely pass. To make matters worse, the underlying layer of snow from the first batch of precipitation, combined with sleet at the start of the second batch, compacted into a layer of ice that was very difficult to remove from sidewalks and roadways after the storm was over. .

Abnormal Winter?

By Tony Gigi, Lead Forecaster

If one would go to the Climatic Prediction Center's web site and compare the strength of this winter's La Nina to the winter of 2007-8, you'd find that both La Ninas were of comparable strength. But unlike the relatively snowless and mild weather of that winter, this past winter was the snowiest moderate or strong La Nina on record and also the coldest moderate or strong La Nina since the winter of 1942-3.

The question then becomes why the stark contrast as moderate and strong La Ninas tend to not have major snowstorms nor colder than average winters. In fact prior to this winter, one would have to go back to the winter of 1909-10 to find a single snow event of a foot or more in Philadelphia during a moderate or strong La Nina winter. This past winter was the first time we ever had two.

To date Philadelphia, has had 44.0 inches of snow. This broke the previous snowiest moderate or strong La Nina of 39.6 inches set in 1916-17. The snowiest La Nina of any strength on record remains 65.5 inches set in 1995-6. Since the winter of 1872-3, there have been 45 La Nina winters and 17 have reached moderate or strong strength.

As to why the cold weather, the North Atlantic Oscillation (NAO) teleconnection index remained strongly negative through the first half of the meteorological winter. This means that arctic air is either suppressed southward into Canada and or blocked from escaping to the east. There is a positive correlation between that teleconnection index and cold winters in the North-east. During the winter of 2007-8, the North Atlantic Oscillation was positive. After mid January and through the first week of February, the Pacific North American (PNA) teleconnection index turned positive. This meant ridging in western North America and troffing in the east. This not only kept the colder than normal weather going, but also initiated an active weather pattern that In-cluded the heaviest single snowfall event and the largest ice storm of the winter in the Philadelphia area.

As to why the big snows, its like the real estate expression of location, location location or if one prefers timing is everything in life. In Philadelphia, there is about a 2:1 ratio of big snow events occurring when the North Atlantic Oscillation was negative. Heather Archambault has also shown that larger precipitation events often occur close to pattern changing times. While the North Atlantic Oscillation remained negative in late December, it was climbing toward neutrality during the Boxing Day Blizzard and was changing from negative to positive during both the

January 26th-27th thundersnow winter storm and the winter storm on February 21-22. Couple the negative North Atlantic Oscillation locking in colder air and a storm track southeast of the region one gets snow. The record breaking 16 consecutive months of negative values for the North Atlantic Oscillation ended this February and not coincidentally February also was the warmest month of the winter.

But unlike La Ninas and El Ninos, there is little if any skill in outlooking the North Atlantic Oscillation more than a few weeks in advance. Because of our proximity to the Atlantic, this adds greater uncertainty to winter outlooks and as was the case the past two winters, if strong enough can keep the typical climatological effects of El Nino and La Nina away.

Enso information:

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml

Information about the NAO and PNA:

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily_ao_index/teleconnections.shtml

Heather Archambault Thesis:

cstar.cestm.albany.edu/nrow/NROW6/Archambault.ppt

Mount Holly Severe Weather Statistics - 2010

Severe Thunderstorm Warnings
148 Issued 66.2%
98 Verified
50 Unverified
Lead Time: 16.7 Minutes

Tornado Warnings
9 Issued 11.1%
1 Verified
8 Unverified
Lead Time: 0.5 Minutes

Flash Flood Warnings
19 Issued 52.6%
10 Verified
9 Unverified
Lead Time: 25.9 Minutes

One of the most important reasons we need storm spotters and accurate and timely reports from them is to help verify our warnings. Despite Doppler Radar and advanced technology, eyes on the sky are still the best way to determine the occurrence of severe weather. An accurate and timely report from a spotter, not only helps downstream residents, but can help NWS meteorologists determine if additional warnings are needed.

Severe Weather Criteria

Severe thunderstorm criteria: The following 3 criteria define a severe thunderstorm, and ONLY the following 3 criteria. If one of these criteria are observed, the thunderstorm is severe.

Hail 1.00 inch (Quarter size)

Wind 50 knots (58 MPH) or greater

Tornado

Other events we would like you to report if observed
Flooding-mainly high amounts or unusual events
Lightning damage
Trees Down...Branches down (wrist size or larger)
Hail-Any size-Since its not common, we'd like to know about it
Ice-Any amount

Severe Weather Safety Tips

- ***All thunderstorms produce lightning.*** Even if the lightning can not be seen, no place outside is safe near thunderstorms.

- ***Use the 30-30 rule.*** If there is 30 seconds or less between lightning and thunder, go to a safer place. Wait at least 30 minutes from hearing the last thunder before leaving the safer location.

- ***Lightning first aid:*** Call 911, Perform CPR and mouth-mouth resuscitation if possible, and don't worry about touching the lightning victim they cannot electrocute you.

- ***Flash flood:*** Never drive through standing water. It could be very deep and fast moving and a deadly combination for ANY vehicle. Flash floods are #1 cause of severe weather related death in the US.

- ***Tornado:*** If there is a tornado touch down near your area get to a safe location either underground or in the center of a building- a closet, or bathroom without windows and use the coats to shelter you from debris. If driving, do not attempt to outrun the tornado...find a ditch or low lying area and lay flat and face down. Cover your head to shield yourself from debris.

For these and more tips for severe weather safety visit:

http://www.srh.noaa.gov/ovn/severewx/safety.php

Just How Hot (or Cold) Was it?

Here is the climatological information for the last 12 months for Philadelphia…

April 2010
Temperature: 58.4 degrees Departure from Normal: +5.3
Precipitation: 2.65 inches Departure from Normal: -0.84

May 2010
Temperature: 67.3 degrees Departure from Normal: +3.8
Precipitation: 2.53 inches Departure from Normal: -1.36

June 2010
Temperature: 78.2 degrees Departure from Normal: +5.9
Precipitation: 2.05 inches Departure from Normal: -1.24

July 2010
Temperature: 81.7 degrees Departure from Normal: +4.1
Precipitation: 6.28 inches Departure from Normal: +1.89

August 2010
Temperature: 79.0 degrees Departure from Normal: +2.7
Precipitation: 2.19 inches Departure from Normal: -1.63

September 2010
Temperature: 72.3 degrees Departure from Normal: +2.3
Precipitation: 0.76 inches Departure from Normal: -2.17

October 2010
Temperature: 59.0 degrees Departure from Normal: +1.8
Precipitation: 5.01 inches Departure from Normal: +2.26

November 2010
Temperature: 48.2 degrees Departure from Normal: +1.1
Precipitation: 1.76 inches Departure from Normal: -1.40

December 2010
Temperature: 32.7 degrees Departure from Normal: -4.7
Precipitation: 3.24 inches Departure from Normal: -0.07

January 2011
Temperature: 29.3 degrees Departure from Normal: -3.0
Precipitation: 3.39 inches Departure from Normal: -0.13

February 2011
Temperature: 37.2 degrees Departure from Normal: +2.4
Precipitation: 2.65 inches Departure from Normal: -0.09

March 2011
Temperature: 44.1 degrees Departure from Normal: +0.9
Precipitation: 4.29 inches Departure from Normal: +0.48

Basic Spotter Courses

Queen Anne's County, Maryland

Saturday, April 16, 2011 at 10 AM
Centreville, MD

Advanced Spotter Courses

Queen Anne's County, Maryland

Saturday, April 16, 2011 at 1 PM
Centreville, MD

Please Check our Website at

http://www.erh.noaa.gov/phi/skywarn/training.html

For additional classes that may become available.

Reporting Procedures

When calling the National Weather Service, have your name and spotter ID ready. Also have an approximate time when severe event took place along with the type of severe weather and location. Lastly, be prompt about calling as every second counts.

Contact Information

If you have any questions, comments, suggestions, or submissions, please contact us via e-mail at phi.skywarn@noaa.gov

Also, please send any name, e-mail, phone or address changes to this e-mail address as well.

Tsunami Continued

basins, and for issuing watches, warnings, advisories and information bulletins whenever a tsunami may have been created. Forecasters at the WC/ATWC are able to issue tsunami bulletins within 5 minutes of an earthquake occurrence. Unfortunately, even this rapid action may not be fast enough if an earthquake occurs just a few miles off the coast of a populated region. Tsunami warning lead time will also be very short or non-existent for an east coast tsunami caused by a slump along the Continental slope for two reasons: 1) earthquake activity may not have caused the slump or, 2) earthquake activity was so weak it fell under established thresholds for tsunami product issuance. Therefore, residents along the mid-Atlantic region of the east coast should be aware of nature's signs of a tsunami moving ashore:

1) An unusual tide recession which exposes the ocean floor not usually visible, even during times of very low tide
2) Conversely, a wall of water heading toward the coast. This wall of water may be accompanied by foaming water immediately preceding it
3) An audible snap produced by the acoustic wave an earthquake that may have occurred in the vicinity, and thus may have produced a tsunami

What action can coastal residents and visitors take to protect themselves from a tsunami?

1) Don't panic. An east coast tsunami probably won't reach epic proportions as seen in the recent Japanese tsunami, or in the 2004 Indian Ocean tsunami, where water levels exceeded thirty feet in some locations. Wave run-up values along the mid-Atlantic coast will likely be in the 1 to 3 foot range. However, tsunami and storm surge are two completely different phenomena. A tsunami is a series of waves, each one lasting between 10 and 30 minutes. A tsunami wave has tremendous force and will knock everything down in its path, so even one foot is very dangerous.
2) Evacuate the beach and immediate coastal areas and relocate to the second and third stories of concrete buildings (parking garages, apartment buildings, casinos). Wood structures, such as private homes, duplexes, and even the boardwalk, may not be strong enough to withstand the force of a tsunami.
3) Boats and ships in harbor are unsafe because they can be tossed around like toothpicks when a tsunami moves ashore. Get off boats and vertically evacuate further inland. With this said, boats and ships well offshore when a tsunami strikes will probably be safe.
4) A tsunami is a series of waves, so the first wave is NOT THE LAST WAVE. In fact, the highest wave may be the second or third wave. After a tsunami strikes, never leave safe areas until an all-clear statement is issued by local authorities.
5) Currents associated with receding water going back into the ocean after each tsunami wave can actually be more dangerous than the incoming wave because of the additional force of gravity. The greatest danger from death and injury during a tsunami is being crushed by floating debris.

Some great websites to visit for more detailed tsunami information are:

www.tsunami.gov
www.tsunami.org
www.weather.gov/phi/reports/tsunami.htm